REMARKS

Claims 1, 21, and 28 have been amended, and Claims 45 and 46 have been cancelled without prejudice. Claims 1, 3-15, 21-23, and 28-42 are now pending in this application. The claim amendments are supported by, for example, Figure 1, paragraphs [0054], [0058], [0061]-[0063], [0084], [0099], and [0139], of the publication of the present application and previous Claims 45 and 46. Applicant respectfully requests the entry of the amendments and reconsideration of the application in view of the amendments and the remarks set forth below.

Discussion of Rejection of Claims under 35 U.S.C. § 103(a)

Independent Claims 1, 21, and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Walton (US 2002/0154705) in view of Walton '040 (US 2003/0125040). In addition, independent Claims 1, 21, and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Vandenameele (US 6,937,665) in view of Walton '040.

Obviousness Standard

To establish a *prima facie* case of obviousness a three-prong test must be met. First, there must be some suggestion or motivation, either in the references or in the knowledge generally available among those of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success found in the prior art. Third, the prior art reference must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). *See* M.P.E.P. § 2143. This is modified by the motivation flowing from (1) the prior art references, (2) the knowledge of the skilled technologist, or (3) the nature of the problem being solved. *In re Dembiczak*, 775 F.3d 994 (Fed. Cir. 1999). This rule has recently been clarified as being flexible in allowing a reason to combine. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 2007 WL 1237837 (2007).

Analysis

Claim 1 in view of Walton and Walton '040

Amended Claim 1 recites "determining combined data signals in the at least one transmitting terminal, said combined data signals being transformed versions of said streams of

data sub-signals, said determining comprising filtering said streams of data sub-signals with a filter so designed that at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals, said filtering being specific for the corresponding receiving user terminal; ... and processing, on the receiving terminal, siad estimates of the sub-user data sub-signals to eliminate the interference between at least two streams of the plurality of streams." None of Walton and Walton '040, alone or in combination, teaches or suggests this feature.

Walton

Walton relates to a communication system that can concurrently support a number of transmissions of various types (e.g., control, voice, broadcast, data, and so on) that may have disparate requirements. Figures 3 and 6 of Walton describes a communication system in which a transmitter with multiple antennas communicates with a receiver with multiple antennas. Walton teaches an approach wherein a full channel state information is first obtained and subsequently used at the transmitter side for preconditioning signals to be transmitted. The full channel state information (CSI) includes characterization of the propagation path between all pairs of transmit and receive antennas for each sub-band. The transmitter preconditions the signals presented to the transmit antennas in a way that is unique to a specific receiver unit and the transmitted signals can only be demodulated by the receive unit associated with the CSI used to precondition the transmitted signal.

The detailed processing is described as follows. Given the channel transfer function at the transmitters, the left eigenvectors may be used to transmit different data streams. The modulation alphabet used with each eigenvector is determined by the available carrier-to-noise-interference ration (C/I) of that mode, given by the eigenvalues. A matrix E, which represents the matrix wherein the columns are the various eigenvectors, is used to precondition the modulation symbols, yielding the preconditioned modulation symbols x. The multiplication shown in Eq.1 is a transformation wherein the NT-dimensional space of vector b is transformed into another NT-dimensional space spanned by the eigenvectors contained in E. See paragraphs [0059] to [0073].

As set out above, Walton teaches carrying out preconditioning signals to be transmitted at the transmitter such that the C/I can be taken into account and the constellation size of the modulation symbols can be adjusted.

Walton '040

The Examiner relied on paragraph [0091] of Walton '040 in rejecting the claims. Paragraph [0091] teaches a full CSI processing. The full CSI includes sufficient characterization across the entire system bandwidth for the propagation path between each transmit-receive antenna pair. In this processing, the channel characterization is available at both the transmitter and receiver. The transmitter unit derives the eigenmodes for the MIMO channel, determines modulation symbols to be transmitted on the eigenmodes, linearly preconditions (filters) the modulation symbols, and transmits the preconditioned modulation symbols. The receive unit performs a complementary processing of the linear transmit processing based on the channel characterization to derive the Nc spatial matched filter coefficients needed for each transmission channel. The receive unit further processes the data with a proper coding and modulation scheme selected for each transmission channel based on the channel's eigenvalues to derive the modulation symbols.

Analysis of Claim 1

As the Examiner admitted, Walton does not teach "filtering said streams of data sub-signals with a filter so designed that at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals." Further, Walton '040 also does not teach this feature.

As described above, Walton '040 merely mentions that modulation symbols are filtered before transmission at the transmitter side based on the channel characterization. Walton '040 does not teach that the filter is designed such that "at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals."

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The Examiner previously relied on the beam steering concept mentioned in paragraphs [0037] and [0075] of Walton, to teach the feature "at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal." The beam steering concept relates to transmit signals at a transmitter at a particular angel so that only one of the antennas at the receiver receives the signal. This is very different from filtering signals at the transmitter to have the same result. Therefore, Walton does not teach a filter "so designed that ..." as recited in Claim 1.

Even if Walton is modified to incorporate the filter of Walton '040, the proposed combination still does not teach the filter so designed as recited. The proposed combination would have a beam steering concept and in addition a filter as described in Walton '040. However, as the filter is not so designed as recited in Claim 1, the proposed combination does not teach this feature.

Also, neither Walton nor Walton '040 teaches the filter is designed that "at least one spatial diversity device of the receiving user terminals receives data sub-signals ... having interference between at least two streams of the plurality of streams of sub-user data sub-signals." The Examiner asserted that this feature is inherent. Applicant respectfully submits that this feature is not inherent. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to support the determination that the inherent characteristic necessarily flows from the teachings of the applied prior art." See M.P.E.P. § 2112.

Particularly, the Examiner stated that "each combined data signal must necessarily be 'having interference between at least two streams of the plurality of streams' because, once all combined data signals are transmitted, they will (inherently) mix and interfere with each other." It is true that once all data signals are transmitted, they will mix and interfere with each other. However, the data sub-signals received by "at least one spatial diversity device of the receiving user terminals" does not necessarily "have interference between at least two streams." For example, the transmitted data signals may be modulated such that, at the at least one spatial diversity device, all the interference signals between streams cancelled each other. In that case, the data sub-signals received by the spatial diversity device has no interference between streams. As the data sub-signals received by "at least one spatial diversity device of the receiving user

terminals" does not necessarily "have interference between at least two streams," Applicant respectfully submits that this feature is not inherent.

Moreover, neither Walton nor Walton '040 teaches "processing, on the receiving terminal, said estimates of the sub-user data sub-signals to eliminate the interference between at least two streams of the plurality of streams." In rejecting previous Claims 45 and 46, the Examiner relied on the channel processor (630). Particularly, the Examiner stated that "the processes of processing and decoding a received signal will, inherently, reject an extraneous interference imposed upon a received signal."

The channel processor (630) receives streams of modulation symbols and demodulates them accordingly. A demodulated streams are sent to a decoder (640) for decoding. The decoded data represents an estimate of the transmitted data for that channel data stream. See paragraph [0125] of Walton.

Walton does not teach, after the operation in the channel processor and the decoder, processing the estimate of the transmitted data to eliminate an interference between streams. The operation by the channel processor (630) is a part of a process in which the receiver determines estimates of the transmitted data. Accordingly, the operation of the channel processor (630) could not correspond to processing "said estimates of the sub-user data sub-signals" to eliminate the interference between two streams.

For at least these reasons, Claim 1 would not have been obvious over Walton and Walton'040. Withdrawal of the rejection is respectfully requested.

Claim 1 in view of Vandenameele and Walton'040

Amended Claim 1 recites "said determining comprising filtering said streams of data sub-signals with a filter so designed that at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals, said filtering being specific for the corresponding receiving user terminal; ... and processing, on the receiving terminal, said estimates of the sub-user data sub-signals to eliminate the interference between at least two streams of the plurality of streams." None of Vandenameele and Walton '040, alone or in combination, teaches or suggests this feature.

Vandenameele

Vandenameele does not teach or suggest this feature. In rejecting Claim 1, the Examiner relied on Figure 2 and col. 9, lines 25-45 of Vandenameele. However, the text as cited by the Examiner merely teaches determining combined data signals in a transmitting terminal, wherein the combined data signals are transformed versions of the data signals. It does not teach "said determining comprising filtering said streams of data sub-signals with a filter so designed that at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals, said filtering being specific for the corresponding receiving user terminal." Further, the Examiner has not pointed to any language in Vandenameele which teaches this feature, but makes a conclusion without any support.

If the Examiner wishes to sustain the rejection of Claim 1 based on the same references, the Examiner is requested to "clearly articulate any rejection early in the prosecution process so the applicant has the opportunity to provide evidence of patentability and otherwise respond completely at the earliest opportunity." See M.P.E.P. § 706.

More particularly, the Examiner is requested to provide Applicant with specific citations to Vandenameele and to explain where and how the reference teaches this feature. Applicant made the same request in a previous amendment filed on April 29, 2010, but the Examiner still did not provide any basis for this feature. Without such a basis, the Examiner's rejection cannot stand.

Moreover, as the Examiner admitted, Vandenameele does not teach "filtering said streams of data sub-signals with a filter so designed that at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals." Further, Walton '040 also does not teach this feature, as discussed above.

In addition, neither Vandenameele nor Walton '040 teaches "processing, on the receiving terminal, said estimates of the sub-user data sub-signals to eliminate the interference between at least two streams of the plurality of streams." In rejecting previous Claims 45 and 46, the Examiner relied on col. 18, lines 24-45 and col. 19, lines 11-36.

The cited portion relates to a technique, i.e., successive interference cancellation, used to mitigate residual multi-user interference. However, the interference recited in Claim 1 is not the interference among different user terminals. Particularly, Claim 1 recites "at least one spatial diversity device of the receiving user terminals only receives data sub-signals being specific for the corresponding receiving user terminal and having interference between at least two streams of the plurality of streams of sub-user data sub-signals." As the device only receives signals "specific for the corresponding receiving user terminal," the interference recited herein is not the interference from other user terminals. As the recited interference in Claim 1 is different from the multi-user interference Vandenameele teaches eliminating, it does not teach the recited processing.

For at least these reasons, Claim 1 would not have been obvious over Vandenameele and Walton '040. Withdrawal of the rejection is respectfully requested.

Claims 21 and 28

Each of amended Claims 21 and 28 recites a similar feature as discussed above with regard to Claim 1. Applicant respectfully submits that, for the same reason stated above, these claims are allowable over the applied prior art. Withdrawal of the rejection is respectfully requested.

Dependent Claims

Claims 1, 3-15, 21-23, and 28-42 are now pending in this application. Claims 2, 3-15, 22, 23, and 29-42 are dependent either directly or indirectly on the above-discussed independent Claims 1, 21, and 28. Although not separately argued, Applicant does not necessarily agree with the rejections or characterizations of the prior art made by the Examiner. Applicant respectfully submits that pursuant to 35 U.S.C. § 112, ¶4, the dependent claims incorporate by reference all the limitations of the claim to which they refer and include their own patentable features, and are

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therefore in condition for allowance. Therefore, Applicant respectfully requests the withdrawal of all claim rejections and prompt allowance of the claims.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

In view of Applicant's remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below. Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: ___1/19/11___

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